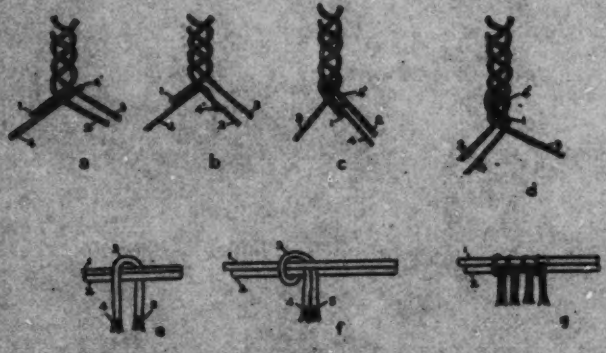
1:Beaglehole and Beaglehole E-5 (1934-5)1938 Pukapukans

292 padded conical hat obviously not made of netting. There is no information available as to the material from which this hat is supposed to have been made nor of the method of manufacture. Gill's hat may represent an artist's conception of the sennit netted hat of the chief.

293 294 Hat Olopa (*taumata kaase*) is made of two-ply twisted sennit netted into a conical shape (pl. 4,4). The technique of the netting is the same as that for ordinary fishnets (p. 207). The meshes are ¾ inch wide. The rim of the hat is made of a thin strip of coconut midrib ¾ inch wide which is bent into a circle of 7¾ inch diameter and the two ends bound together with sennit. Six vertical strips of midrib, each 8½ inches long, are bound at equal intervals to the rim. The distal ends of these strips are notched, gathered together to form the apex of the cone and fastened together with figure-of-eight turns of sennit. The rim strip and two bracing circular strips of midrib, one strip 2¾ inches from the rim, the other 4½ inches from the rim, are passed through the meshes of the hat material and bound to the vertical bracing strips by transverse turns of sennit. A 6-inch fringe is attached to the hat. Fringe material is made by fastening coconut fiber (*laukaase*) to a base strip of pandanus (fig. 18,*e-g*). Two strips of fringe each



283 294 FIGURE 18.—Braiding and fringing technique: *a-d*, braiding; *e-g*, fringing technique (*mata tuhalahalaha*, made to bend over) for sennit hat. *a*, three-ply sennit braid, end of ply (1) either short or thin, making it necessary to join to it another strand; ply 1 brought to left and renewal strand (4, 4') laid alongside 1, under ply 2; short end 4' placed over ply 3. *b*, short end 4' folded down and along ply 2. *c*, ply 3 brought across ply 2 and short end of ply 4', locking this short end in position; ply 1 and ply 4, working together as single ply, brought across from outside to pass over ply 3. *d*, short end (4') of added ply securely locked; ply 2 passes over plies 1, 4; ply 3 passes over 2 and ply 4 passes again across 3; continuation of braiding makes join in plies barely perceptible save under closest scrutiny. *e*, strand (*aano*) of coconut-husk fibers about 12 inches long, doubled (3) over two strips of pandanus material (*lauuaia pakapaka*) (1, 2) which are knotted together at one end and looped over toe, forming near limb (4) and far limb (5). *f*, both limbs (4, 5) brought up between two strips (1, 2), passed over lower strip (2), and pulled tight. *g*, strands of fiber added successively to right; pulled tight and kept close together; pandanus strips (1, 2) hidden by turns; fibers of strands indicated by light shading of strand ends (4, 5). Pukapukan technique inverts Manihikian technique noted by Buck (29, p. 135, fig. 47).

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19 inches long are fastened to the netting of the hat. One end of one fringe is laid on the outside rim of the hat, passing up and over the outside apex, and down to the rim again at a point opposite the starting point. The fringe is fastened to rim, netting meshes, and apex by a continuous sennit cord which makes transverse turns round fringe and points of attachment about 1 inch apart. The second fringe is applied to the hat in a similar manner, passing from rim over apex to opposite rim at right angles to the first fringe. A third length of fringe 24 inches long is fastened round the rim in a horizontal plane with a continuous sennit cord. To the inside of the rim a piece of pandanus ½ inch wide is bound with continuous turns of sennit to form a hat band. Informants suggested that the more correct hat band material is *uvlo* bark. Two lengths of sennit are tied to the apex of the hat and their ends knotted together to form a suspension loop 11¾ inches long by which the hat may be hung up when not in use. The fringe is combed out at regular intervals to prevent snarling of the fibers.

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The priests of each lineage (*po*) wore headdresses when consulting the gods in the god houses or on the religious structures. Headdresses not in use were hung up in the god houses. The relation of the headdresses to the gods is obscure. Some thought that the headdress was worn in the Underworld by the god in question, others that a priest wore a special headdress because a certain god gave him inspiration when he was an initiate, still others that the headdress was worn only for consulting special gods. Probably all three opinions are equally correct. Some headdresses were described by informants who had seen them in their extreme youth. Gaps of memory were filled in by reference to chants. None today can make any of the headdresses of which there are no survivals on the island.

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The headdress of priests of Muliwutu was called *aumanga*. It was also associated with the god Te Laupapa. Two strips of red-dyed *uvlo* bark (*uuti uvlo*), each about 2 inches wide and long enough to pass round the head, were fastened together to form a headband. At front and back between the double headband strip were fastened two pieces of turtle shell, each about 2 inches wide and from 12 to 16 inches long. The two pieces were about 5 inches apart at the base and crossed like a St. Andrews Cross.

The headdress of Matanga, Yangalipuka, and Yemanaia sub-lineage, was called *pulou*, and was associated with the god Te Awunwu. The head was oiled and the hair laid straight back flat on the head, overhanging the neck and back. A double headband of *uuti uvlo* bark was wound round the head. To the front of the band was fastened a single strip of turtle shell, to the tip of which was tied a large bunch of *uuti uvlo* streamers which fell back over the hair and onto shoulders and back.

The headband of Tua and of Matanga sub-lineage was called *aumanga pakeyau kotaua* (headdress of crossed frigate bird feathers). It was associated with the god Ngaliyeyau. It consisted of the usual *uuti uvlo* headband, to the front of which were fastened two frigate-bird wings crossing each other to give a fish-tail effect. An alternate headdress for priests of Tua was associated with the goddess Tuna. It was made of fine mesh sennit netting and was termed *hupanga* 32. The headdress probably resembled the sennit hat of the chief without the coconut fiber fringe. The net of the goddess Tuna had the virtue of rendering invisible anything over which it was cast, and also of blinding the thing hidden under it. Hence when a foreign vessel was reported off the island, the priests of Tuna donned their net headdresses, thus symbolizing that Tuna had placed her net over the whole island and that it was now invisible to the crews of the foreign canoes.

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The headdress of Yalonga and Yayi lineages was called *putiki kehevo*. It was associated with Te Atua Vaeua and Te Alongaua. The long hair was oiled and braided

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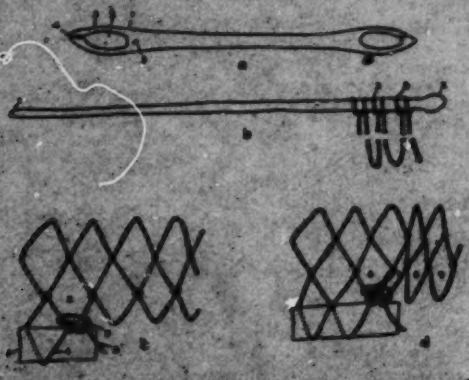
227 284 In one hank only does the point lashing commence with the distal hole. Transverse oblique turns fix the buckle, and the lashing is bound with the finishing end of the lashing thread, which passes round the lashing and is knotted on itself. The commencement end of the separate lashing thread for the proximal hole is knotted to the near side distal lashing and serves as a binder for this lashing. The free end passes to the proximal hole on the near side and makes four transverse oblique turns through this hole and round the shank. When these turns are completed, the free end passes up to seize the smoot, lashes the smoot to the head of the shank, and again seizes the smoot for about 1 inch beyond the head lashing.



227 284 FIGURE 44.—Netting needles and netting technique. *a*, netting needle (*umere*) of pukaterea wood (*Cleodendron*): needle 1.496 inches long; 1, expanded end ¾ inch wide; 2, central longitudinal slot (*pā*); 3, sides of slots (*manga*); 4, slit (*tuwai*) through which netting cord passes; 5, hole (*pu*) through which commencement end of netting cord knots; cord wound longitudinally between two slots. *b*, netting needle (*tai* or *yubi*) (*Citrus*) of coconut midrib: needle 6¾ inches long, about ¾ inch diameter; 1, blunt end; 2, terminal knob; proximal end (3) slightly notched (*unkelelere*) and three lengths of sennit cord attached by clove hitches; when loaded, needle carries 10 or more lengths of netting cord attached to proximal end. *c*, netting technique: to make mesh by ordinary technique, mesh gauge (1) is placed in position so that upper edge touches completed mesh (2); netting cord (3) brought down behind gauge and up around lower edge to form lower loop (4); needle passes through loop of mesh (2), crossing drawn taut on upper edge of gauge where it is held with left thumb while netting knot (5) is made. *d*, to narrow net, same technique followed, but two completed meshes (6,7) brought together by superimposing 7 over 6 with netting knot made as before; in practice, meshes 6, 7, 8, 9 would be brought together by superimposing 7 over 6, 8 over 7, and 9 over 8, with netting knot made around all four gathered meshes (only two superimposed meshes are shown).

NETTING

Nets are made from two-ply twisted *uwo* fiber, two-ply twisted sennit (*aha*), and from fibers prepared from the aerial roots of the *yulu* pandanus tree. The methods of preparing these netting cords are described on page 143.

1 [See Category 283 or 116 – analyst.]

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223 284 lashes rod to crossbar end; free end of cord carried down to handle and lashes ends of rods of handle; finally, free end of cord carried down handle, making transverse turns around handle at intervals of 15 inches; 4 feet from proximal end of handle, cord makes 8 transverse turns around handle and fastens with overhand knot. This lashing enables the bird catcher more quickly to draw in his net by providing a firm hold for his hands. Light rods (4) attached to stout rods (3, 3') by scarf joins lashed with transverse turns on one side and oblique transverse turns on the other; two ends of light rods overlap (5) and are fastened together; natural springiness of thin rods makes net framework heart-shaped. Net attached to handle before ends of light rods are lashed together; each rod passes through marginal meshes (6) of net, net being attached directly and without use of marginal cord; proximal end meshes of net are gathered on a double cord which loops loosely around head of handle below crossbar and has two ends knotted together. Net is 29 inches deep; greatest width at mouth 31 inches.

171 227 286 Netting needles (*tui* or *uuua*) and mesh gauges (*yika*) are used. Of two types of needle, the *uuua* type (fig. 44,*a*) is similar to those used in other parts of Polynesia. One end of the netting cord is passed through the hole and knotted. The rest of the cord is wound longitudinally between the two slots; the knotted end prevents the cord from slipping off the needle when only a few longitudinal turns remain on it. The second type of netting needle (*tui* or *yuki*, fig. 44,*b*) is loaded by making a clove hitch on it at the point of the notch and just forward of the terminal knob (which prevents the clove hitch from slipping off the needle) with the free end of the netting cord. A length of about 30 inches is measured off and another clove hitch made round the needle. This process is repeated until a sufficient length of cord is attached to the needle, hanging from the terminal knob end in double lengths of about 15 inches. In using the needle, a double length of cord is slipped from the blunt point of the needle. When this length has been used up, a second length is slipped from the needle and the process is repeated as the netting advances. In slipping the cord from the needle, the clove hitch in the cord unties itself. Needles are made in various sizes to suit different sized meshes.

The *yika* gauge is a flat rectangular piece of wood scraped smoothly or a piece of turtle shell. A mesh gauge of turtle shell (C8131), used to make the flying-fish net in the museum collection is 3½ inches long, ¾ inch wide and ⅛ inch thick. The edges are polished smooth. Mesh gauges are of different sizes according to the size of mesh required.

TECHNIQUE

171 227 286 To make a net is *tui te kupenga*; a mesh is *mata kupenga*. The Pukapukan technique of netting (fig. 44, *c*) corresponds to the Samoan method described by Buck (27, pp. 470-472) with one variation.

The netting needle is loaded and the required mesh gauge selected. An assistant holds a light supporting rod of wood around which the first meshes are made, the assistant judging their size by eye. This variation on Samoan starting technique is the same as the Manihikian technique save that a supporting rod replaces the supporting cord used in Manihiki. (See 29, p. 161, fig. 73.) When the Pukapukan netter has made the first row of meshes he transfers these meshes from the rod to a supporting cord. The ends of the cord are knotted and the cord looped round a stick placed in the ground or else round the toe of the netter. As each row is completed, the net is turned and successive rows are added by the same technique.

One Pukapukan method of narrowing bag nets is by the addition of extra meshes, the common Polynesian technique. A second method is by making a netting knot round two or more meshes. Thus in the bird net and in the flying-fish net described below, the bottom of the net is narrowed by gathering together under the thumb four successive meshes and making the netting knot round these four meshes together (fig. 44,*d*). The

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method corresponds to the famous technique of "dropping meshes in the various rows" (27, p. 472): gathering together two or more meshes in one row to function as a single mesh means that in the next row there will be fewer meshes with which to work, hence the technique is equivalent to dropping meshes from subsequent working rows.

TYPES OF NETS

The seine net (*kupenga*) and the large hand fishnet (*tae yaeke*) have been described (pp. 57-58). The flying-fish dip net (*tae malolo*) consists of a long handle, a crossbar and framework (figs. 45,*a*, 46). Its use is described on page 58.

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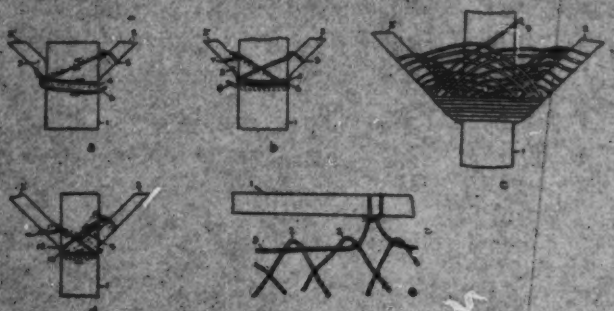

FIGURE 46.—Lashing of flying-fish net framework. *a*, commencement of lashing of stout rods (2, 2') to handle (1): commencement end of semit cord (3) laid on far side of left rod; cord brought around in front of handle and transversely (4) around to back, across to far side, then up diagonally across near side, passing between rod (2) and handle, across front of rod (5), then diagonally down far side of handle, passing around and across front of handle (6). *b*, continuation of lashing: free end (6) passes to back of handle, diagonally up and across to rod (2'), around front of rod (7), behind it and diagonally down and across front of handle, and around back of handle (8); this establishes lashing pattern, which is continued for about 12 or more complete diagonal turns passing to each rod. *c*, completed lashing pattern is here shown with six turns only; *d*, on top of pattern are superimposed four superior diagonal lashing turns; method of making turns shown here (inferior lashings omitted); free end of cord (9) passes diagonally down far side of handle, around to front (10), across handle, diagonally up far side (11), around rod (2'), diagonally down near side, around far side of handle again, up diagonally across near side (12) to rod (2), around this rod and diagonally down across far side of handle; lashing pattern is continued until there are two diagonal lashings up and down handle; finishing end of cord carried diagonally across near side of handle to rod (2), makes two transverse turns around rod and buries finishing end underneath these two turns; finished lashing is of neat and pleasing design. *e*, attachment of flying-fish net to frame: 1, rod of framework; 2, marginal net meshes; 3, marginal cord passes through meshes, then up to frame, making a clove hitch around rod, passing down to pick up more marginal meshes; process continued until all marginal meshes are picked up on cord, rod clove hitches 6 to 8 inches apart, free ends of cord wound round handle just below cross-lashing holding suspensory lashing of crossbar to handle; second cord passes through marginal meshes at proximal end of net and is fastened to stout rods above lashing of crossbar.

1:Beaglehole and Beaglehole E-5 (1934-5)1938 Pukapukans

227 The flying-fish practice net (*tae penu*) used by young men to catch pandanus keys thrown at them in practice sport is of similar shape to the flying-
286 fish net, but smaller.

It consists of a handle of *wriqu* wood, 4 feet long and 1½ inches in diameter, a crossbar 8 inches long, ¾ inch in diameter, and two stout rods of pandanus wood, 3 feet long, which are fastened to handle and crossbar, the ends bent close together and tied without the intermediary of lighter rods (*matai*) used in the flying-fish net frame. The
[264] lashings of framework and attachment of net to frame are similar to those of the flying-fish net. The practice net is made of the two-ply twisted fiber from the aerial roots of *yulu* pandanus. The net is 13 inches wide at the mouth, 18 inches deep.

223 The large bird net (*wuata*, fig.45,*b*) differs in shape from the flying-fish net.

The net framework is attached to the handle in such a way that the distal end of the framework rises at an obtuse angle from the plane of the handle. The distal point of the frame is 10 inches higher than the plane of the handle. The framework when viewed sideways presents the shape of an enlarged spatula. When the bird catcher brings down the net upon a flying or roosting bird, the net is reversed so that the distal end of the frame is lower than the plane of the handle. A bird flying from the net is more likely to be caught by the downward projecting spatula-shaped net than it would if the net frame were in the same plane as the handle. The frame and handle are made of light wood so that the net may be easily used in the tree tops. The net itself is made of fine two-ply twisted sennit.

TRAPS AND SNARES

136 Because the fauna of a coral atoll is extremely simple, there are in Puka-
223 puka only two types of bird snare and a form of the widely distributed western Polynesian rat trap.

224 The construction and operation of the rat trap (*vaka kiole*) are shown in figure 47. The trap is baited with mature coconut flesh (*i'piipi*) and set
[171] in a runway made by rats. The rat is removed by the owner of the trap, who resets the bait stick and spring mechanism.

The coconut-shell bird snare (*maunga kui*) is shown in figure 48,*a*. Another bird snare (*maunga tuli*), shown in figure 48,*b*, is set on the beach, weighted down with stones, and the birds driven through it.

225 Though not strictly traps or snares, wooden structures (*pa wonu*) in
231 which turtles are kept may be described in this context.

Stakes of *puapua* or *pukonae* wood, each about 5 feet long and 1 inch in diameter, are driven into the sea bottom a few yards from low water level of the beach. The stakes are arranged about 2 inch apart to form a rectangular enclosure 3 feet square, and 4 feet high. The stakes are bound together at top and bottom with horizontal poles and a continuous lashing which makes transverse turns round vertical and horizontal members. Baby turtles, caught as they emerge from their shells, are placed in these enclosures. They are fed regularly on squid and octopus until they are mature enough to be killed for a special food division. The size of enclosures observed varied according to the number of turtles placed within. An enclosure of the above size housed two turtles with shells about 12 inches long. Bigger structures contained five or more small

1:Beaglehole and Beaglehole E-5 (1934-5) 1938 Pukapukans

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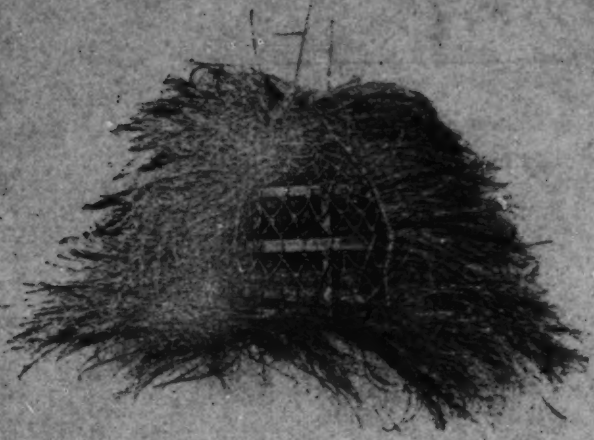

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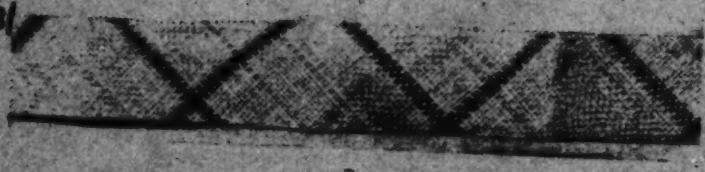

HAT AND MALO. *A*, SENNIT NETWORK HAT OF THE CHIEF, SHOWING COCONUT MIDRIB STRIPS OF FRAME, TWO-PLY TWISTED SENNIT NETTING, AND COCONUT FIBER FRINGE DECORATION. *B*, MODERN SAMPLER FOLDED TO SHOW WIDTH WHEN MALO IS DONNED. *C*, MALO OF FINELY PLAITED PANDANUS, OLD AND UNFOLDED. BOTH MALOS SHOW THE TYPICAL DIAMOND-SHAPED DESIGN.

793 If the priest has been wholly attentive to his duties, and has
834 been continent the night before the favor is asked, then the
226 gods turn a favorable answer and fishing is successful.

227 [See 1: Beaglehole and Beaglehole, p. 58--analyst.] A
286 kaloma net, e.g., a net used for small beach fish, is made of uka, 10-12 fathoms long, and 6-9 feet deep. It might require 2-3 years to make. The mesh is very small. Vai pule shells were attached to the bottom of the net to serve as weights, and sections of pukama wood were attached at the top to serve as floats. Hauling ropes of kawa tau were served with uka, and attached to the ends of the net.

854 The Pukapukan infant is fed when he is hungry. He plays
855 when he has energy. He sleeps when he is tired. He does
863 any or all these things at any time of the day or night, almost any time, because he mercifully does tend to sleep for most of the night, provided he is young enough, and when he is older, what matters it if he does or not? He can look after himself by this time and so not trouble his elders. The Pukapukan child has no feeding difficulties. If he is not hungry, he does not eat. The oler child takes his food share: away, and either stores it up for a hungry hour or else shares it with another. Nor has the child any excretory difficulties. He is not badly scolded if he dirties his mat; the mat is easily cleaned and so is he by being dropped into the sea. And soon, since no one pays much attention to his excreta, and excretion is considered as natural in this society as eating, he soon learns to go to the sea himself whenever he has need to.

764 [See 1: Beaglehole and Beaglehole, p. 162--analyst.] (From Pau--doubt as to accuracy) Gravestones for children: small stones of any material about 8-9 inches high. Young boy, not wakatane: the stone is placed in the ground with its long side upright. Young girl, not w'wawine: the stone is placed in the ground with its long side on the ground. Children will be buried close together, with the head and feet stones touching those of the next grave. There is no feeling about keeping apart in death wale atua even if they should happen to belong to the same po. Stones for children will be unshaped punga.

285 Note that the making of baskets with handles was not an old
177 Pukapukan custom, but has been introduced, most likely from Rarotonga. Even today these baskets have not any other use save as Bible carriers on Sunday. Their place in Pukapuka was